



## ENGINEERING SPECIFICATION

### SYMCOM MODEL ISS-102C-M-LC Intrinsically Safe Switch

#### PART 1 GENERAL

##### 1.1 REFERENCES

- A. 30 CFR Part 18 – Mine Safety and Health Administration
- B. ANSI/IEEE C62.41 – American National Standards Institute/Institute of Electrical & Electronics Engineers

##### 1.2 WARRANTY

- A. Manufacturer Warranty: The manufacturer shall guarantee the equipment to be free from material and workmanship defects for a period of five years from the date of manufacture when installed and operated according to the manufacturer's requirements.

#### PART 2 PRODUCTS

##### 2.1 MANUFACTURERS

The equipment specified shall be the Model ISS-102C-M-LC, manufactured by SymCom, Inc.

##### 2.2 DESCRIPTION

- A. Regulatory Requirements:
  - a. MSHA has evaluated the device to comply with the requirements in CFR 30 18.68 for intrinsically safe devices. The evaluation number is 18-ISA070001-0.

##### 2.3 PERFORMANCE/DESIGN CRITERIA

- A. Capabilities and Features:
  - 1. Inputs:
    - a. The equipment shall accept two control inputs from the hazardous area.
    - b. The equipment shall accept single-phase input voltage rated 120VAC.
  - 2. Outputs:
    - a. The equipment shall include one Form C output relay. Contacts pilot duty rated 180VA@120VAC. Contacts general purpose rated 5A@120VAC.
  - 3. Functional Specifications:
    - a. The equipment shall provide the following functions: dual-channel differential/latching.
    - b. The equipment shall provide logic for pump-up or pump-down applications.
    - c. The equipment shall close the output contact when input channel #2 is activated.
    - d. The equipment shall open the output contact when input channel #1 and input channel #2 are inactivated.
    - e. The equipment shall include a debounce delay of 2 seconds.
    - f. The equipment shall include an input sensitivity threshold of 100k ohms.
    - g. The equipment shall include one LED indicating the relay state.
      - 1) The LED shall illuminate upon activation of the output relay.
- B. Intrinsically Safe Requirements:
  - 1. The equipment shall have the following entity parameters:
    - a.  $V_{oc}=16.8V$
    - b.  $I_{sc}=1.2mA$
    - c.  $L_a=100mH$
    - d.  $C_a=0.39\mu F$
    - e.  $P_o = \frac{V_{oc} * I_{sc}}{4}$
  - 2. The equipment shall provide intrinsically safe circuit into the following locations:
    - a. Class I, Divisions 1 & 2, Groups A, B, C, & D
    - b. Class II, Divisions 1 & 2, Groups E, F & G
    - c. Class III
  - 3. The equipment shall provide two inputs to the hazardous area.
- C. Electromagnetic Compatibility:
  - 1. The equipment shall be immune to electrostatic discharge per IEC 61000-4-2, Level 3, 6kV contact discharge and 8kV air discharge.
  - 2. The equipment shall be immune to electrical fast transient bursts per IEC 61000-4-4, Level 3, 4kV power supply port, 4kV input/output ports.
  - 3. The equipment's power supply port shall be immune to electrical surges per IEC 61000-4-5, Level 4. Specified limits shall be 4kV line-to-line and line-to-ground.
  - 4. The equipment shall be immune to radiated radio frequency emissions. Specified limits shall be 10V/m at 150 MHz.



- D. Dielectric Isolation: Equipment withstands an alternating current potential of 1000V plus twice the rated voltage of the equipment for 1 minute without breakdown between uninsulated live parts and the enclosure with the contacts open and closed; between terminals of opposite polarity with the contacts closed; and between uninsulated live parts of different circuits.
- E. Enclosure Class of Protection: The equipment shall provide IEC IP20 (finger safe) protection.
- F. Environmental Requirements:
  - 1. The equipment shall operate continuously without derating in ambient temperatures of -40° to 55°C (-40° to 131°F).
  - 2. The equipment shall operate continuously without derating in relative humidity of up to 95% non-condensing per IEC 68-2-3.
  - 3. The equipment shall operate properly after storage in ambient temperatures of -40° to 80°C (-40° to 176°F).
- G. Dimensions: The equipment dimensions shall not exceed 3.5" in height x 2.084" in width x 2.35" in depth.
- H. Mounting:
  - 1. The equipment shall be mountable on standard 35 mm DIN rail.
  - 2. The equipment shall be surface mountable on a backplane.

End of Section